WHAT IS CLAIMED IS:

1. A wireless communications system for transmitting information between a base transceiver station and a subscriber unit comprising:

mode determination logic, in communication with said base transceiver station and said subscriber unit, for determining, in response to a received signal, if a subscriber datastream should be transmitted between said base transceiver station and said subscriber unit utilizing spatial multiplexing or non-spatial multiplexing.

2. The wireless communications system of claim 1 wherein said mode determination logic has an input for receiving a measure of a transmission characteristic related to said received signal.

3. The wireless communications system of claim 2 wherein said mode determination logic includes logic for:

comparing said measured transmission characteristic to a transmission characteristic threshold; and

selecting one of spatial multiplexing and non-spatial multiplexing in response to said comparison of said measured transmission characteristic to said transmission characteristic threshold.

4. The wireless communications system of claim 3 wherein said transmission characteristic threshold varies in response to system conditions.

5. The wireless communications system of claim 2 wherein said transmission characteristic includes at least one of:

delay spread;

post-processing signal-to-noise ratio;

cyclical redundancy check (CRC) failure;

residual inter-symbol interference;

mean square error;

coherence time; and

path loss.

6. The wireless communications system of claim 1 wherein said base transceiver station and said subscriber unit utilize a multiple access protocol to transmit said subscriber datastream, wherein said multiple access protocol is selected from at least one of a group of multiple access protocols consisting of: code-division multiple access, frequency-division multiple access, time-division multiple access, space-division multiple access, orthogonal frequency division multiple access, wavelength division multiple access, wavelet division multiple access, orthogonal division multiple access, and quasi-orthogonal division multiple access .

7. The wireless communications system of claim 1 wherein mode determination information is communicated between said base transceiver station and said subscriber unit over a control channel.

8. The wireless communications system of claim 1 wherein said mode determination logic includes logic for:

comparing a delay spread measure for said received signal to a delay spread threshold; and

selecting spatial multiplexing for transmission of said subscriber datastream if said delay spread measure is below said delay spread threshold.

9. The wireless communications system of claim 1 wherein said mode determination logic includes logic for:

comparing a post-processing signal-to-noise ratio for said received signal to a post-processing signal-to-noise ratio threshold; and

selecting spatial multiplexing for transmission of said subscriber datastream if said post-processing signal-to-noise ratio is above said post-processing signal to noise ratio threshold.

10. The wireless communications system of claim 1 wherein said mode determination logic includes logic for:

receiving a CRC failure indicator in response to said received signal; and

selecting non-spatial multiplexing for transmission of said subscriber datastream when said CRC failure indicator exceeds a CRC failure threshold.

11. The wireless communications system of claim 1 wherein said mode determination logic includes logic for:

comparing a residual inter-symbol interference measure for said received signal to a residual inter-symbol interference threshold, and

selecting spatial multiplexing for transmission of said subscriber datastream if said residual inter-symbol interference measure is below said residual inter-symbol interference threshold.

12. The wireless communications system of claim 1 wherein said mode determination logic includes logic for:

calculating a mean square error for said received signal; and

selecting spatial multiplexing for transmission of said subscriber datastream if said calculated mean square error is below a mean square error threshold.

13. The wireless communications system of claim 1 wherein said mode determination logic includes logic for:

comparing a coherence time measure for said received signal to a coherence time threshold; and

selecting spatial multiplexing for transmission of said subscriber data stream if said coherence time measure exceeds said coherence time threshold.

14. The wireless communications system of claim 1 wherein said mode determination logic includes logic for:

comparing a path loss measure for said received signal to a path loss threshold; and

selecting spatial multiplexing for transmission of said subscriber data stream if said path loss measure exceeds said path loss threshold.

15. The wireless communications system of claim 1 wherein said mode determination logic has an input for receiving system specifications related to the signal receive capability of at least one of said base transceiver station and said subscriber unit.

16. The wireless communications system of claim 1 wherein said mode determination logic has an input for receiving system specifications related to the signal transmit capability of at least one of said base transceiver station and said subscriber unit.

17. The wireless communications system of claim 1 wherein said mode determination logic includes logic for:

determining if both said base transceiver station and said subscriber unit support spatial multiplexing; and

selecting non-spatial multiplexing for transmission of said subscriber datastream if one of said base transceiver station and said subscriber unit does not support spatial multiplexing.

18. The wireless communications system of claim 1 wherein non-spatial multiplexing transmission modes include single-carrier transmissions, multi-carrier transmissions, multi-code transmissions, transmit diversity, and beamforming.

19. The wireless communications system of claim 18 wherein transmit diversity includes selection diversity, space-time coding, and maximum ratio combining.

20. The wireless communications system of claim 18 wherein said base transceiver station and said subscriber unit are capable of transmitting said subscriber datastream in more than one of said non-spatial multiplexing transmission modes.

21. The wireless communications system of claim 1 wherein said mode determination logic resides within said subscriber unit.

22. The wireless communications system of claim 1 wherein said mode determination logic resides within said base transceiver station.

23. A method for operating a wireless communications system comprising steps of:

receiving a signal transmission at one of a base transceiver station and a subscriber unit via said wireless communications system; and

determining, in response to said received signal transmission, whether a subscriber datastream should be transmitted between said base transceiver station and said subscriber unit utilizing spatial multiplexing or non-spatial multiplexing.

24. The method of claim 23 further including steps of:

measuring a transmission characteristic of said received signal transmission;

comparing said measured transmission characteristic to a transmission characteristic threshold; and

selecting one of spatial multiplexing and non-spatial multiplexing in response to said comparison of said measured transmission characteristic to said transmission characteristic threshold.

25. The method of claim 24 wherein said transmission characteristic threshold varies in response to system conditions.

26. The method of claim 24 wherein said transmission characteristic includes at least one of:

delay spread for said received signal transmission;

post-processing signal-to-noise ratio for said received signal transmission;

CRC failure for said received signal transmission;

residual inter-symbol interference for said received signal transmission;

mean square error for said received signal transmission;

coherence time for said received signal transmission; and

path loss.

27. The wireless communications system of claim 23 wherein said base transceiver station and said subscriber unit utilize a multiple access protocol to transmit said subscriber datastream, wherein said multiple access protocol is selected from at least one of a group of multiple access protocols consisting of: code-division multiple access, frequency-division multiple access, time-division multiple access, space-division multiple access, orthogonal frequency division multiple access, wavelength division multiple access, wavelet division multiple access, orthogonal division multiple access, and quasi-orthogonal division multiple access .

28. The method of claim 23 further including a step of indicating an operation mode for subsequent transmissions in response to said determination.

29. The method of claim 28 further including a step of using a dedicated control channel to indicate said operation mode.

30. The method of claim 23 further including a step of indicating a change in operation mode for subsequent transmissions in response to said determination.

31. The method of claim 30 further including a step of using a dedicated control channel to indicate said change in operation mode.

32. The method of claim 23 further including a step of communicating the spatial multiplexing or non-spatial multiplexing capability of one of said base transceiver station and said subscriber unit using a dedicated control channel.

33. The method of claim 23 further including steps of:

handing off said subscriber unit from a first base transceiver station to a second base transceiver station: and

switching the mode of operation between spatial multiplexing and non-spatial multiplexing in response to said handoff.

34. The method of claim 23 further including steps of:

determining when said subscriber unit has traveled from a first coverage cell to a second coverage cell; and

switching the mode of operation between spatial multiplexing and non-spatial multiplexing in response to said change of coverage cells.

35. The method of claim 23 further including steps of:

determining if both said base transceiver station and said subscriber unit support spatial multiplexing; and

selecting non-spatial multiplexing if one of said base station transmission station and said subscriber unit does not support spatial multiplexing.

36. The method of claim 23 further including steps of:

comparing a delay spread measure for said received signal transmission to a delay spread threshold; and

selecting spatial multiplexing for transmission of said subscriber datastream if said delay spread measure is below said delay spread threshold.

37. The method of claim 23 further including steps of:

comparing a post-processing signal-to-noise ratio for said received signal transmission to a post-processing signal-to-noise ratio threshold; and

selecting spatial multiplexing for transmission of said subscriber datastream if said post-processing signal-to-noise ratio is above said post-processing signal to noise ratio threshold.

38. The method of claim 23 further including steps of:

receiving a CRC failure indicator in response to said received signal transmission; and

selecting non-spatial multiplexing for transmission of said subscriber datastream when said CRC failure indicator exceeds a CRC failure threshold.

39. The method of claim 23 further including steps of:

comparing a residual inter-symbol interference measure for said received signal transmission to a residual inter-symbol interference threshold, and

selecting spatial multiplexing for transmission of said subscriber datastream if said residual inter-symbol interference measure is below said residual inter-symbol interference threshold.

40. The method of claim 23 further including steps of:

calculating a mean square error for said received signal transmission; and

selecting spatial multiplexing for transmission of said subscriber datastream if said calculated mean square error is below a mean square error threshold.

41. The method of claim 23 further including steps of:

comparing a coherence time measure for said received signal to a coherence time threshold; and

selecting spatial multiplexing for transmission of said subscriber data stream if said coherence time measure exceeds said coherence time threshold.

42. The method of claim 23 further including steps of:

comparing a path loss measure for said received signal to a path loss threshold; and

selecting spatial multiplexing for transmission of said subscriber data stream if said path loss measure exceeds said path loss threshold.

43. A wireless communications system for transmitting information between a base transceiver station and a subscriber unit comprising:

a control channel for communicating if a subscriber datastream should be transmitted between said base transceiver station and said subscriber unit utilizing spatial multiplexing or non-spatial multiplexing.

44. The wireless communications system of claim 43 wherein said control channel is used to indicate the spatial multiplexing or non-spatial multiplexing capability of one of said base transceiver station and said subscriber unit.

45. The wireless communications system of claim 43 wherein said control channel is used to indicate a change in the mode of operation between spatial multiplexing and non-spatial multiplexing.

46. The wireless communications system of claim 43 wherein said control channel includes a dedicated field in a frame that is part of said subscriber datastream.

47. The wireless communication system of claim 43 further including mode determination logic, in communication with said base transceiver station and said subscriber unit, for determining, in response to a received signal, if a subscriber datastream should be transmitted between said base transceiver station and said subscriber unit utilizing spatial multiplexing or non-spatial multiplexing.

48. The wireless communications system of claim 47 wherein said mode determination logic has an input for receiving a measure of a transmission characteristic related to said received signal.

49. The wireless communications system of claim 48 wherein said mode determination logic includes logic for:

comparing said measured transmission characteristic to a transmission characteristic threshold; and

selecting one of spatial multiplexing and non-spatial multiplexing in response to said comparison of said measured transmission characteristic to said transmission characteristic threshold.

50. The wireless communications system of claim 49 wherein said transmission characteristic includes at least one of:

delay spread;

post-processing signal-to-noise ratio;

cyclical redundancy check (CRC) failure;

residual mean inter-symbol interference;

mean square error;

coherence time; and

path loss.

51. The wireless communications system of claim 43 wherein said base transceiver station and said subscriber unit utilize a multiple access protocol to transmit said subscriber datastream, wherein said multiple access protocol is selected from at least one of a group of multiple access protocols consisting of: code-division multiple access, frequency-division multiple access, time-division multiple access, space-division multiple access, orthogonal frequency division multiple access, wavelength division multiple access, wavelet division multiple access, orthogonal division multiple access, and quasi-orthogonal division multiple access .